

# **Implementation of Intranet Scene Preview for Feature Animation**

**Leonard J. Reder (*reder@ieee.org*)**

**Gene Takahashi (*gtakahas@wbfa.com*)**

**Warner Bros. Feature Animation**



# Problem

- High-resolution digital media (animation), stored on a central file server, cannot be viewed by many members of the crew.
- Production personnel often need to view “hook ups” of scenes.
  - Enhance continuity.
- Mechanism for maintaining all production scenes on-line in a form accessible to any type of computer was needed.
  - Scenes archived to tape due to disk space limitations.
  - Restoring on-line is time consuming.

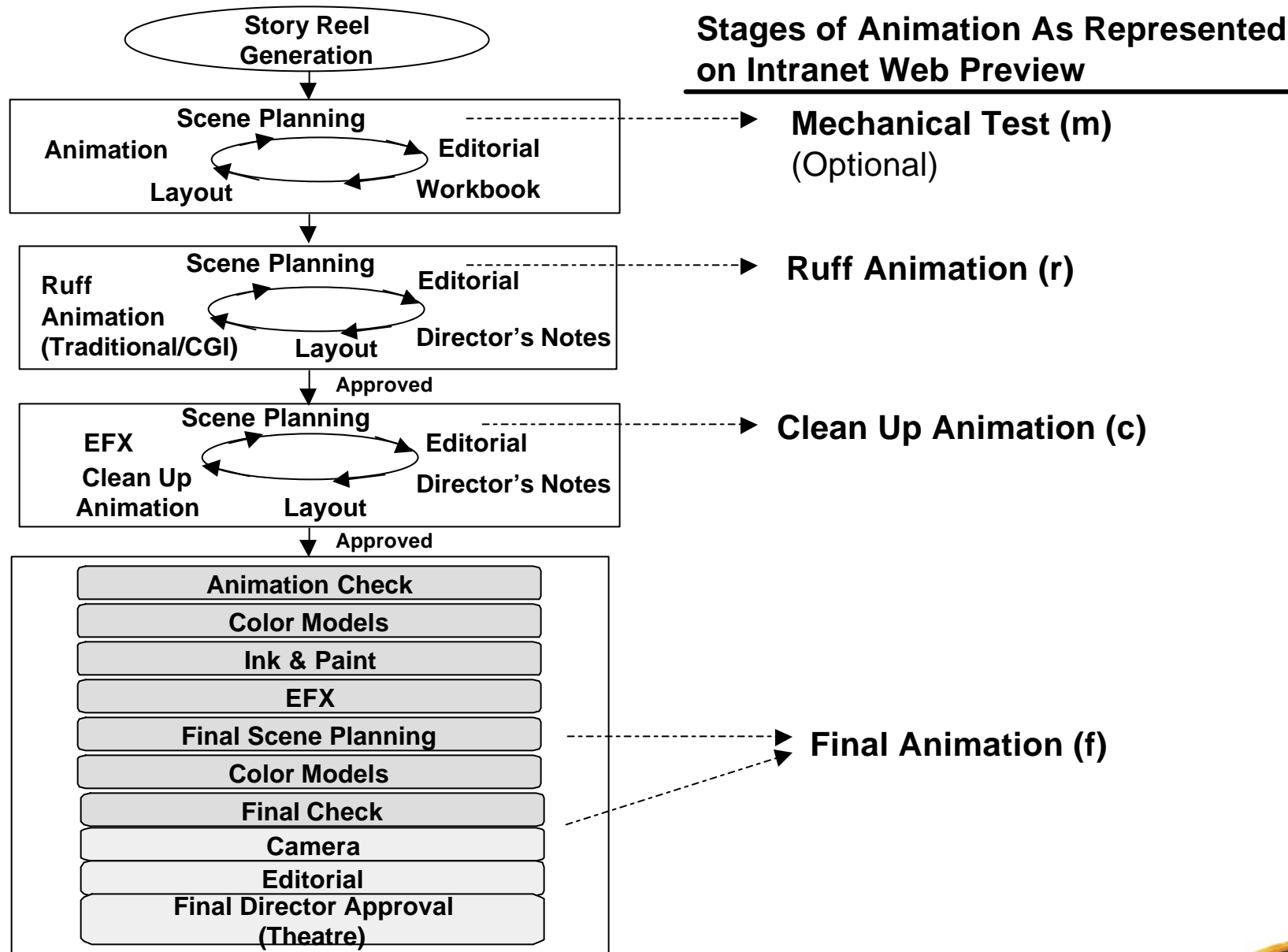


# Introduction

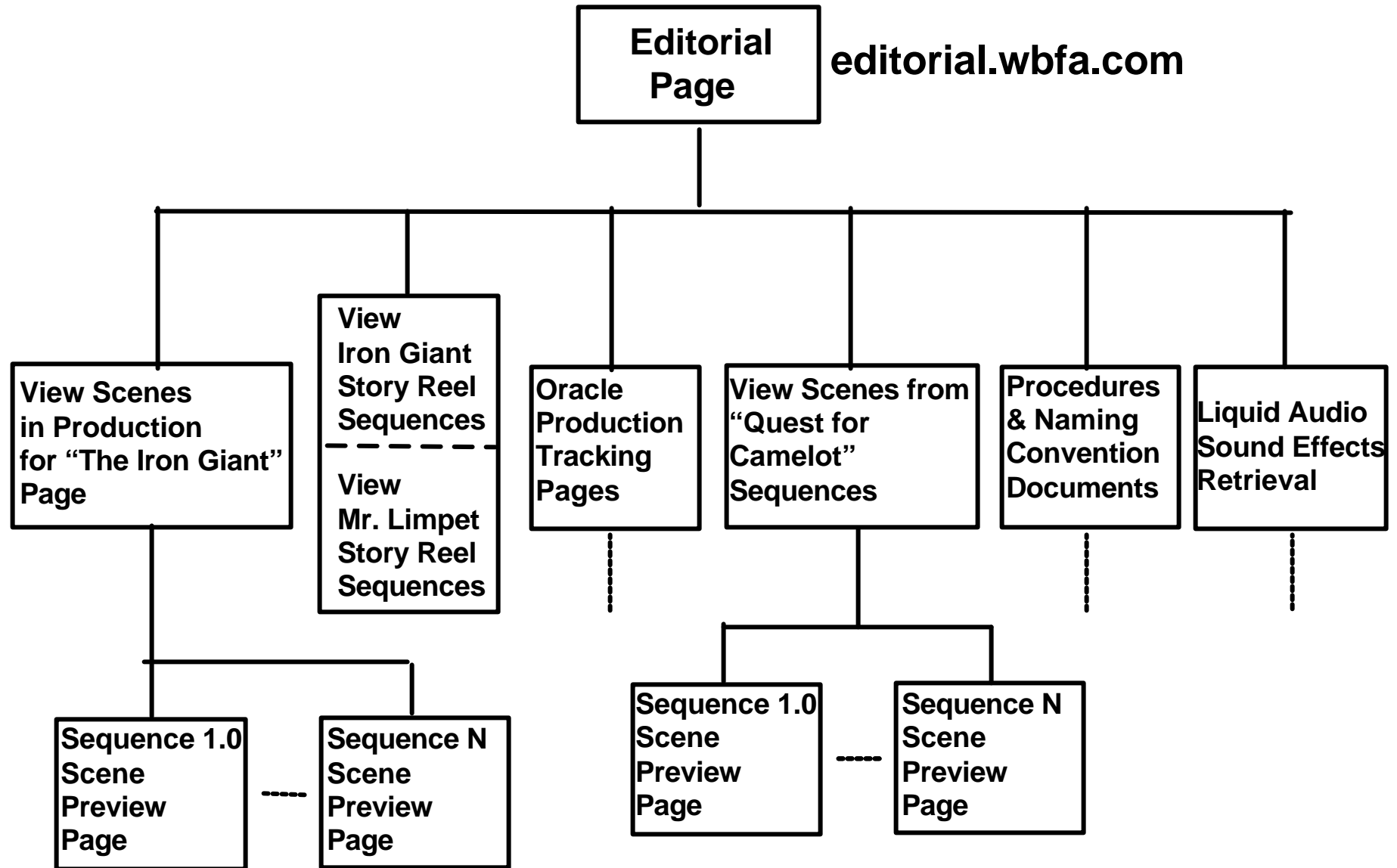
- Capability was developed so all members of the production staff could easily view production material as it was being animated.
- Animated scene content “served” for preview capability via Intranet.
  - Entire movie on-line stored as low resolution media.
- QuickTime movie download and play (24fps)
  - 320 x 240 pixel frames compressed with Apple video codec.
  - 720 x 540 pixel frames compressed with JPEG (D1 video compatible, no audio).
- Custom software developed to automatically generate web pages and QuickTime every night.



# Animation Process Flow and Iteration



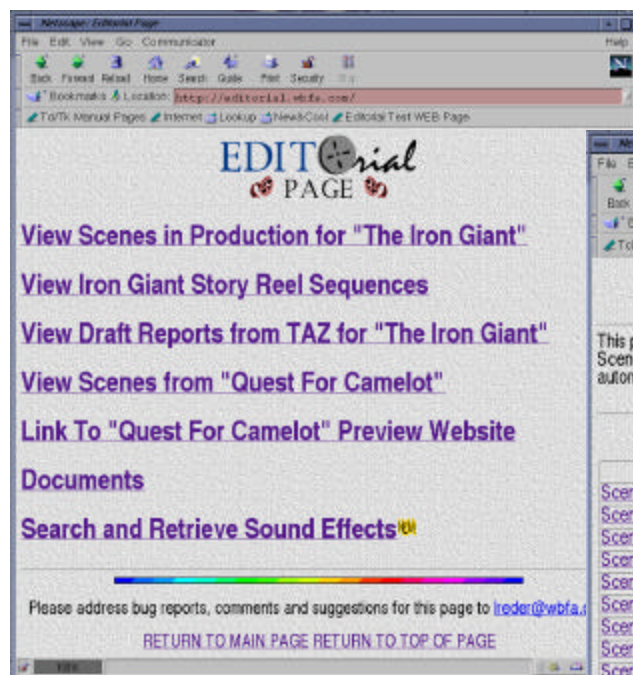
# Intranet Web Site Tree Diagram



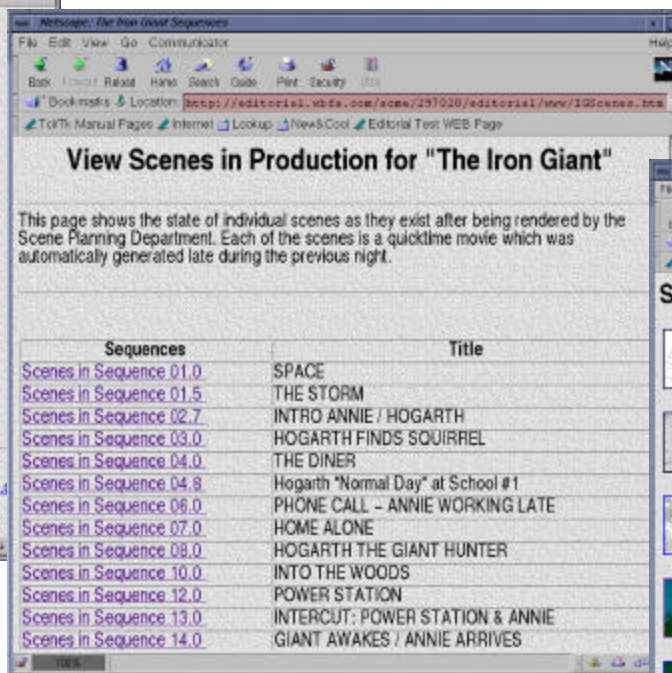
# Progression of Web Pages

## One Steps Through To Preview A Scene

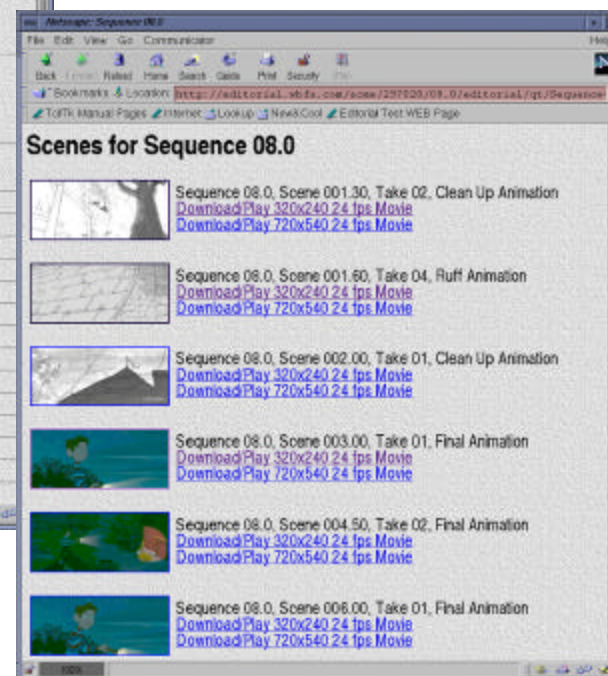
Top-Level Editorial Page



Sequences In Production



Scene Previews



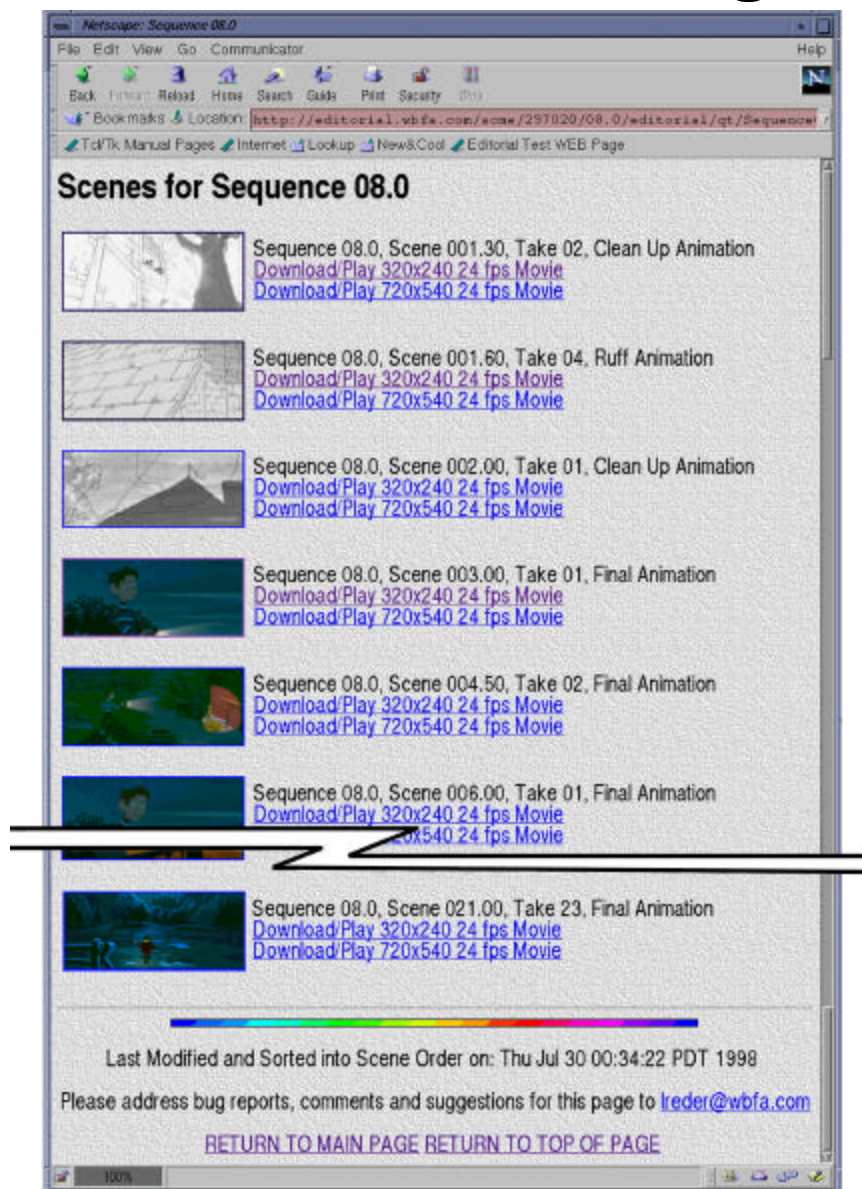
Intranet Scene Preview for  
Feature Animation

October 29, 1998, 6





# Scene Preview Page



Intranet Scene Preview for  
Feature Animation

October 29, 1998, 7



# Frame Of QuickTime Movie As Displayed on SGI Workstation

Ruff Animation



Clean Up Animation



Final (Color) Animation



- Hogarth character in “The Iron Giant”.
- 2.35 cinemascope aspect ratio format.



# Frame Of QuickTime Movie As Displayed on SGI Workstation

Ruff Animation



Clean Up Animation



Final (Color) Animation



- The dragon in “Quest for Camelot”, May 1998.
- 1.66 aspect ratio format.

# Production Directory Hierarchy

- Directory Structure:

/top-level

    /<Production Desc.>

        /<Sequence Number>

            /<Scene Number>

                /<Intermediate Directory>

                    /<Testid\_Take\_Type[\_Desc.]>

Examples:

    /anim/IronGiant/08.0/024.60/render/001\_02\_r

    /anim/Quest/23.0/042.30/render/001\_01\_f

- QuickTime Naming Convention:

<Sequence Number>-<Scene Number>-<Take Number>-<Type>[-d1].mov

Examples:

    08.0-024.60-02-r.mov

    08.0-024.60-02-r-d1.mov

    23.0-042.30-01-f.mov



# HTML Page Structure

**<HTML>**

**<HEADER>**

*Title of page appears as title of browser window.  
Other data about this document placed here.*

**</HEADER>**

**<BODY>**

*Text, images, formatting tags and hypertext  
(or hypergraphic) links of document.*

**</BODY>**

**</HTML>**



# Header HTML Source of Sequence 08.0 Scene Preview Page

```
<HTML>
<HEAD>
<! DO NOT EDIT THIS FILE -- IT IS MACHINE GENERATED >
<TITLE>Sequence 08.0</TITLE>
</HEAD>
<BODY background="/top-level/XXXX/editorial/www/images/paper.gif">
<H1>Scenes for Sequence 08.0</H1>
<P>
<! START OF SCENES >
```



# Scene Record HTML Source of Sequence 08.0 Scene 004.50

BACKUP

```
<! XXXX-08.0-004.50-014-02-f >
<TABLE BORDER=0 CELLSPACING=0 CELLPADDING=5>
  <TR>
    <TD ALIGN=center>
      <A HREF="/top-level/XXXX/08.0/editorial/qt/08.0-004.50-02-f.mov">
        <IMG SRC="/top-level/XXXX/08.0/editorial/qt/08.0-004.50-02-f.gif"><br>
      </A>
    </TD>
    <TD ALIGN=left>
      Sequence 08.0, Scene 004.50, Take 02, Final Animation      <br>
      <A HREF="/top-level/XXXX/08.0/editorial/qt/08.0-004.50-02-f.mov">
        Download/Play 320x240 24 fps Movie<br>
      </A>
      <A HREF="/top-level/XXXX/08.0/editorial/qt/08.0-004.50-02-f-d1.mov">
        Download/Play 720x540 24 fps Movie<br>
      </A>
    </TD>
  </TR>
</TABLE>
<P>
```



# Tail HTML Source for Sequence 8.0 Scene Preview Web Page

```
<! END OF SCENES >
<P>
  <center>
    <P><HR><IMG SRC="/top-level/XXXX/editorial/www/images/line.spectra.nice.gif"><P>
    Last Modified and Sorted into Scene Order on: Thu Jul 30 00:34:22 PDT 1998
  <P>
    <font size=3>
      Please address bug reports, comments and suggestions for this page to
      <A HREF="mailto:lreder@wbfa.com">lreder@wbfa.com</a><br><br>
      <A HREF="http://editorial.wbfa.com">RETURN TO MAIN PAGE</A>
      <A HREF="/top-level/XXXX/08.0/editorial/qt/Sequence08.0.html">RETURN TO TOP
OF PAGE</A>
    </font>
  </center>
</BODY>
</HTML>
```



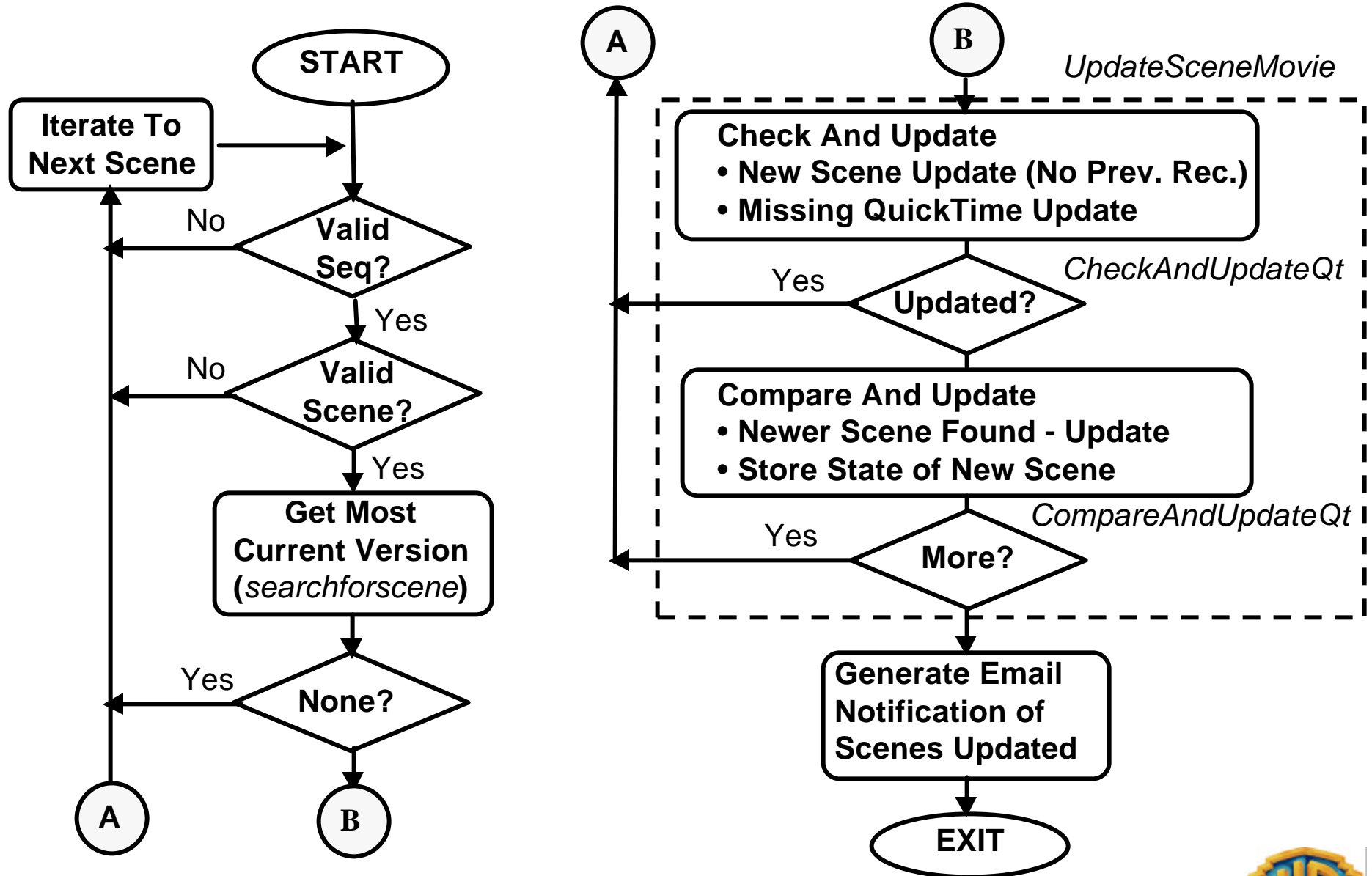


# Implementation

- Web and QuickTime technologies make all animated scenes available for viewing on any type of computer.
- Software developed utilizing scripting languages (e.g. Perl, C-shell).
- Three scripts and one Perl library were developed.
  - Main script of interest is *UpdateScene.pl* that updates scene previews.
  - Built on Perl library that handles all image file manipulation tasks and HTML generation.



# Structure and Logical Flow of UpdateScene.pl

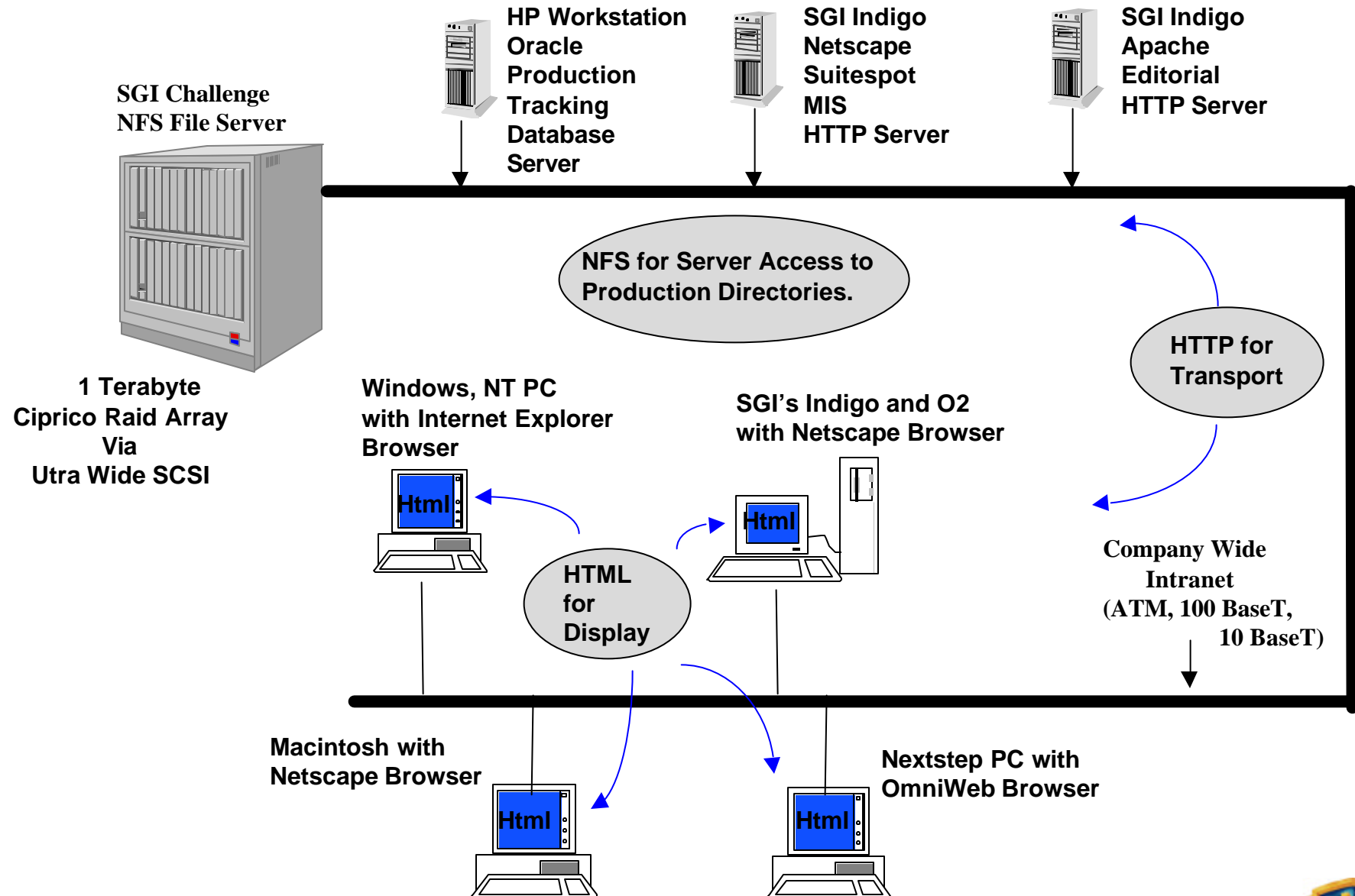


# Custom Software Implementation

- Scan directories and update:
  - Update QuickTime, resize high resolution TIFF image sequence, add custom annotation, WB logo and generate QuickTime movie files.
  - Stripe with production audio.
  - Update HTML scene record.
  - Keep simple distributed database to track state of each scene on every web page.
- Image manipulation is performed with SGI IRIX end-user image and media tools (e.g. *imginfo*, *izoom*, *dmconvert*, *makemovie*) and public domain SDSC image tools (*imcomp*, *imconv*, *imcopy*, *impaste*).



# Client/Server Intranet Configuration



Intranet Scene Preview for  
Feature Animation

October 29, 1998, 18



# QuickTime Compression

QuickTime Format	Storage	
	(KByte/frame)	(KByte/foot)*
320x240 Apple Video Codec	71-100	1136-1600
720x540 JPEG	13-58	208-928

\* 16 frames per foot when using 4 perf 35mm



# Download Performance Utilizing HTTP with Various Computer/Network Combinations

Machine (CPU)/ Network Connection	Download Speed (KByte/sec.)	Download Speed (320x240 pixel compressed frames/sec.)	Download Speed (720x540 pixel compressed frames/sec.)
SGI Impact (R4400 MIPS 250 MHz.) ATM	1966	27.69-19.66	151.23-33.90
SGI Indigo XL (R4400 MIPS 200 MHz.) ATM	1501	21.14-15.01	115.46-25.88
Windows NT PC (Pentium II 133 MHz.) 100baseT	1179	16.61-11.79	90.96-20.33
SGI O2 (R5000 MIPS 180 MHz.) 100baseT	1033	14.55-10.33	79.46-17.81
Macintosh Model 9600 (PowerPC 350 MHz.) 10baseT	496	7.00-4.96	38.15-8.55
NextStep PC (Pentium II 133 MHz.) 10baseT	373	5.25-3.73	28.69-6.43
Macintosh Model 7500 (PowerPC 100 MHz.) 10baseT	154	2.17-1.54	11.85-2.66





# Future Enhancements

- 1 Serve media by streaming rather than download and play.
  - Store QuickTime as so called “Fast Start” files so most standard players will play while downloading.
  - Use commercially available software??
- 2 Automatically assemble sequences and serve them.
  - Custom scripts in development.
- 3 Retain old versions and serve them.
  - Requires asset management.



# Summary

- Cost effective scene preview capability has been developed.
  - Short implementation time.
  - Utilized standard SGI and public domain SDSC image tools.
  - Less expensive PCs could be utilized.
- Instantly access scenes for use in verifying scene content.
- Download and playback on MAC, Windows, NextStep and UNIX.
- Automatically generated email alerts production of scenes changed.
- Remote locations were able to keep abreast of changes by using the Time Warner Corporate Network to access the editorial server.



# Conclusions

The WEB capability is production driven and continually enhanced. The ability to view any scene at any point in the production process by any staff member has been realized helping to increase efficiency and reduce costs in the production of animated features.

